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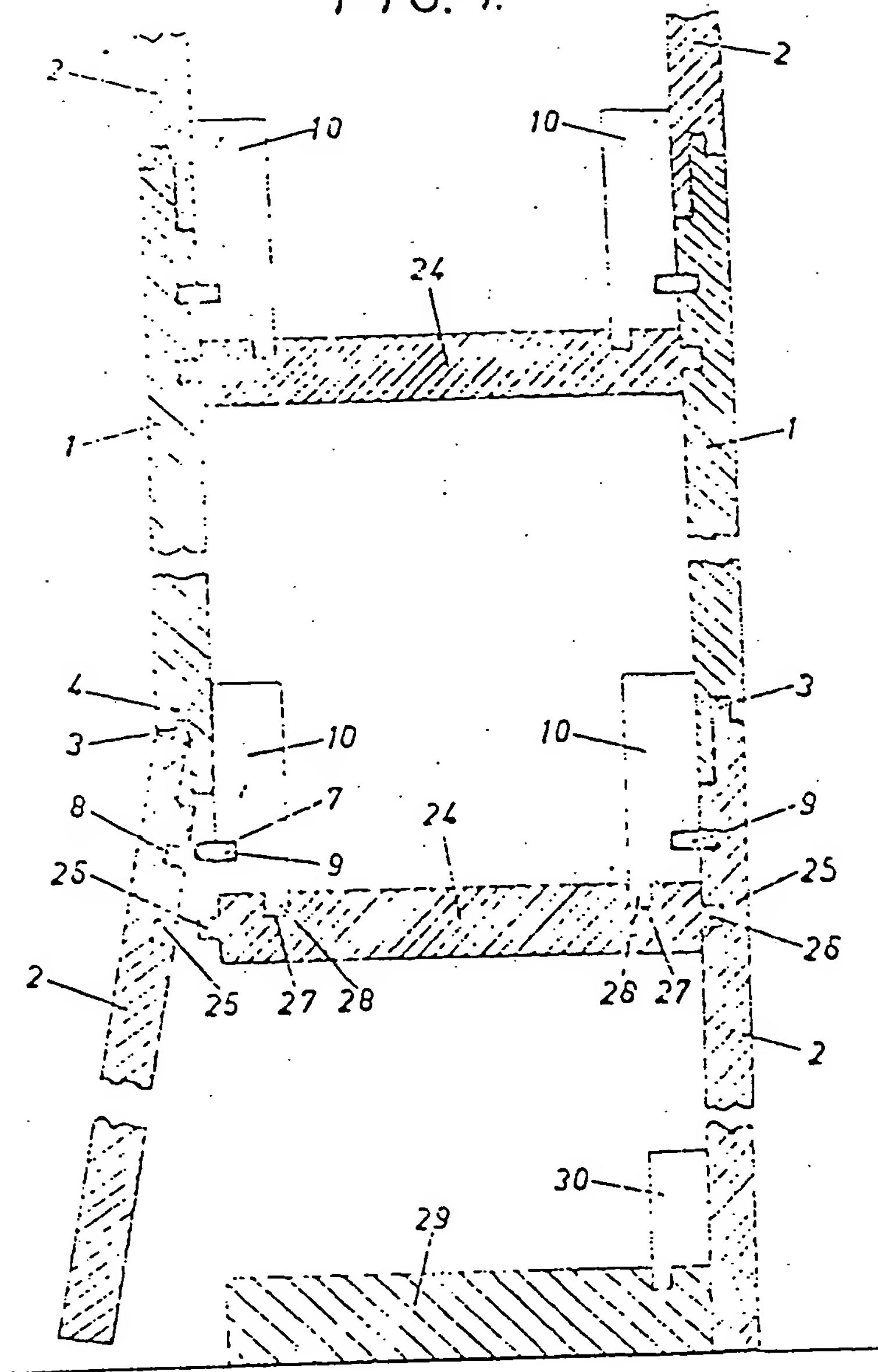
COMPLETE SPECIFICATION

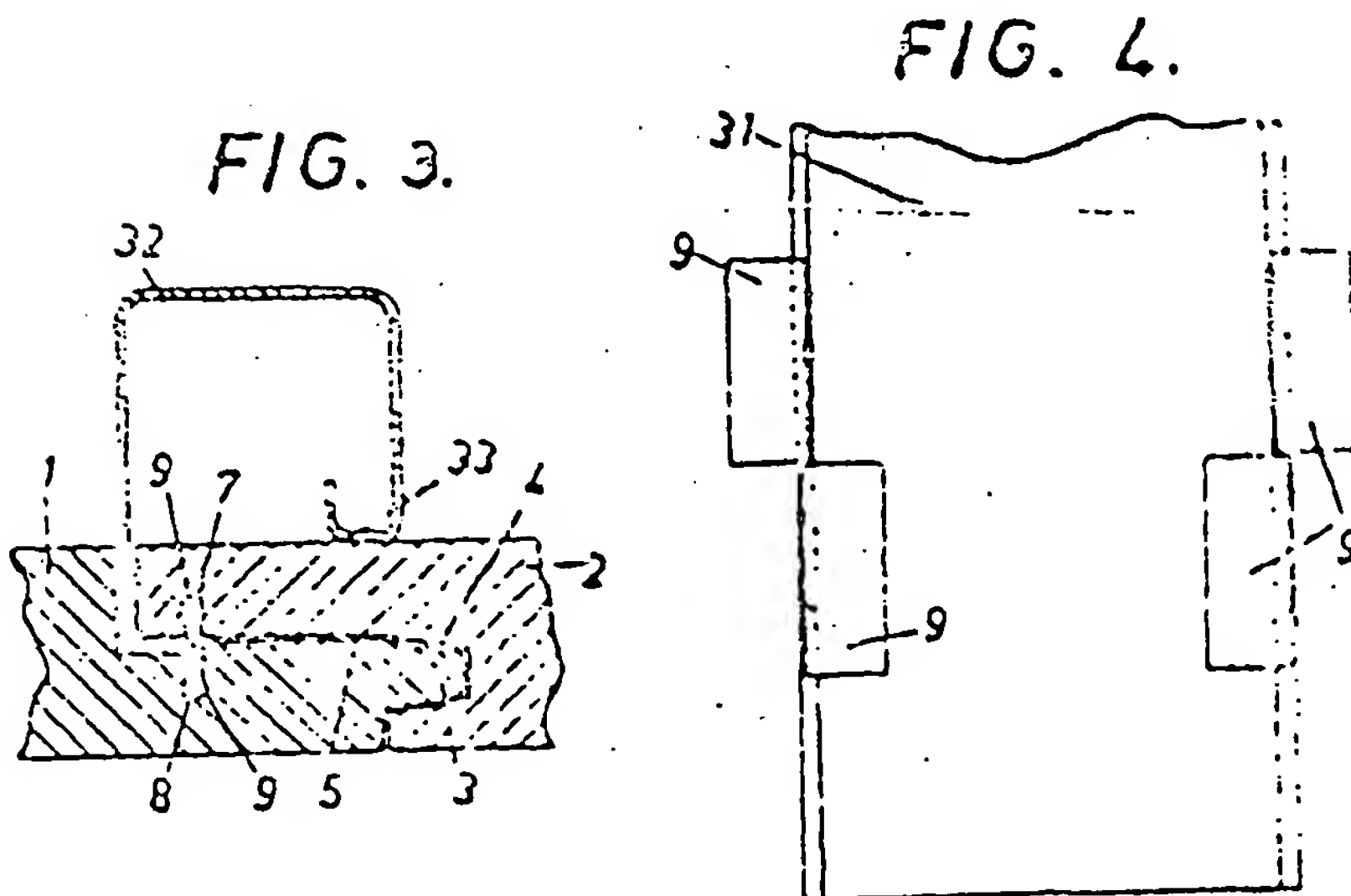
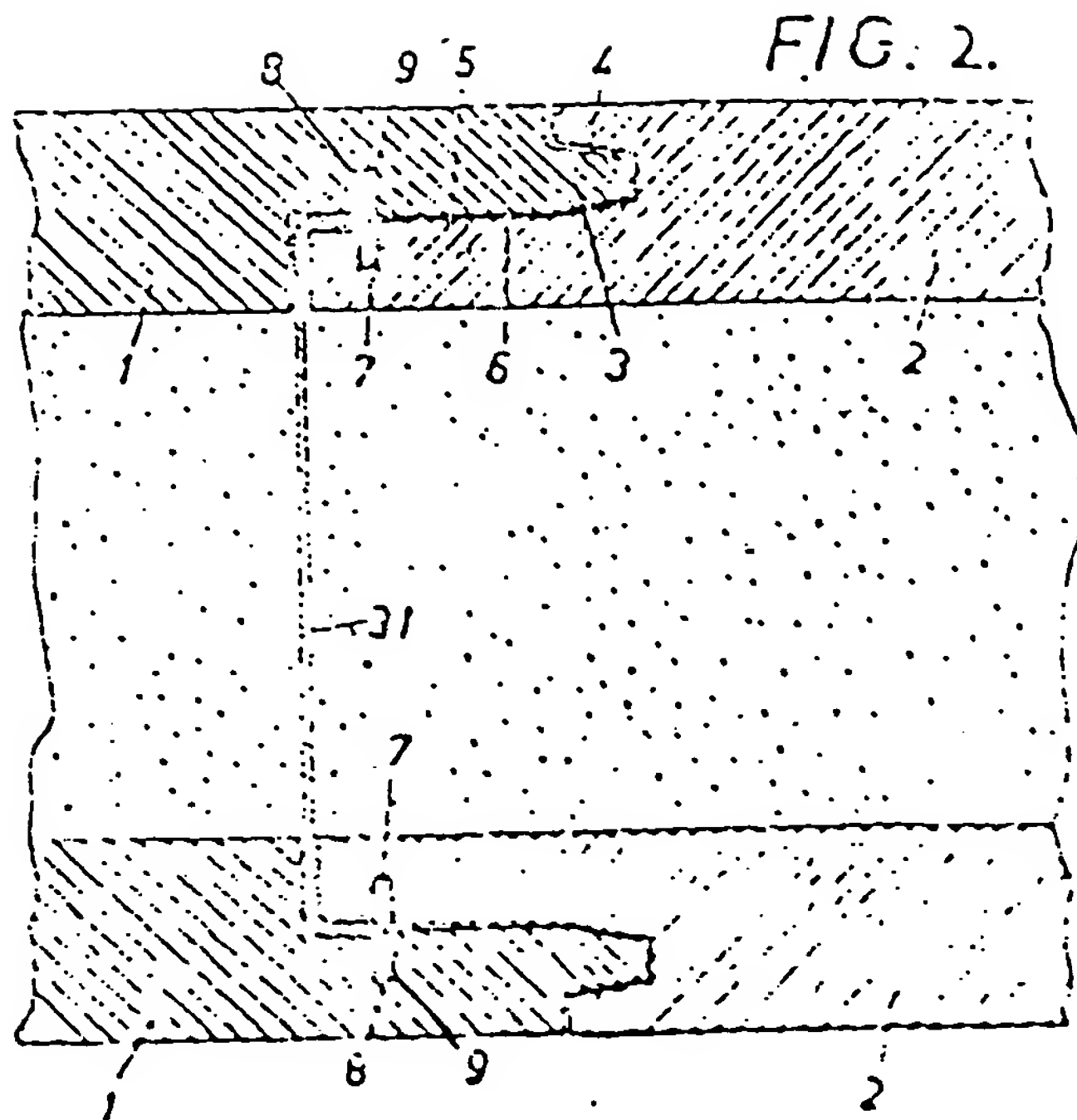
2 SHEETS

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Sheet 1

FIG. 1.





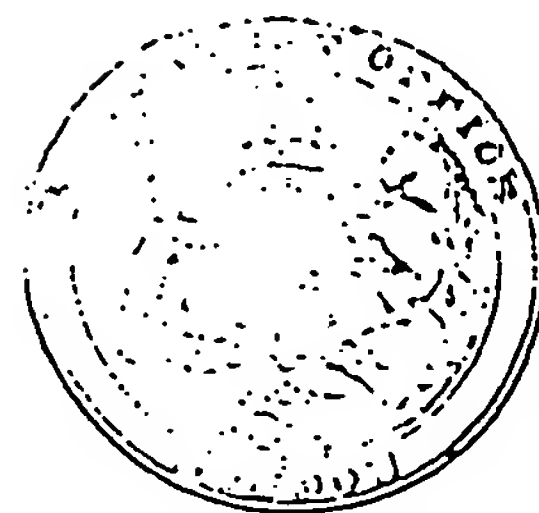


# PATENT SPECIFICATION

(11) 1237744

## DRAWINGS ATTACHED

- (21) Application No. 30913/68 (22) Filed 23 June 1968  
(43) Complete Specification published 30 June 1971  
(51) International Classification F 16 b 5/00  
(52) Index at acceptance  
A4H W2D W2H W3  
(72) Inventor BENGT ROLAND ANDERSSON



## (54) IMPROVED BUILDING STRUCTURE

(71) We, AB LUNSTRÅ, a Swedish Joint-Stock Company, of Hisingrs Kärra, Sweden, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an improved building structure composed of panels joined at their edges by first tongue and groove connections having elements located in the plane of the building structure as well as by second tongue and groove connections having elements located perpendicular to said plane.

The mounting and interconnection of fabricated panel elements implies certain difficulties and an object of this invention is to provide a self locking device by means of which the building panels may be interlocked in a simple and efficient manner: characterized in that the two tongue and groove connections are designed to permit a second panel to be swung into the plane of the building structure after being brought into contact with elements of the connections at a first panel already fitted in the plane of the structure, and further in a third member locked in the joint between the two panels and extending outside the same substantially at right angles to the panels.

The accompanying drawings show, by way of example only, several embodiments of the invention, in which:

Figure 1 shows in section a partition wall composed of two parallel sets of panels;

Figure 2 shows a section through a modified design of a double skin wall where metal members are utilized to form the tongues of the second connection;

Figure 3 shows a front view of an alternative arrangement of the metal member utilized in Figure 2; while

Figure 4 shows a modified design of a metal member utilized to form the second tongue connection.

Figure 1 shows a wall composed of panels arranged spaced apart and parallel to each

other and connected according to the invention. The panels are alternatively marked 1 and 2 respectively. One is provided at least at one edge with a tongue 3, and the other panel 2 is provided with a corresponding groove 4. This tongue and groove connection thus is arranged in the plane of the wall. The panels 1 and 2 have interengaging parallel surfaces 1 parallel to the plane of the wall at half the thickness of the panels. A groove 7 is arranged in a backing member 10 fitted at the joint and opposite to a groove 8 in the adjacent panel 1 or 2, respectively. These grooves 7 and 8 thus are arranged perpendicularly to the plane of the wall and are arranged to receive a common tongue 9. This tongue may consist of a strip of fibre board and is suitably connected to one of the grooves 7 or 8, for instance by glueing. In order that a sufficient support for the two panels in relation to each other be obtained it is essential that the distance between the tongue and grooves of the second connection and the first mentioned connection 3, 4 be greater than the depth of the tongue 3. These two tongue and groove connections are designed to permit a second panel to be swung into the plane of the building structure.

The panels 1 and 2 are comparatively thin and the joint is strengthened by the backing member 10 provided on the inside of the panels. The interconnection of the spaced panels is made by means of cross pieces 24, which are interlockingly connected to the panels, each cross piece forming together with a backing members 10 fitted at each edge thereof a third member, which is locked in the joints between the two panels and extends away from the same substantially at right angles to the panels. For this purpose each panel 1 and 2 is provided with a longitudinal groove 25, in its inner plane side, said groove being adapted to receive a correspondingly formed tongue 26 on the adjacent edge of the cross piece 24. Parallel to but spaced from and perpendicular to each

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Figure 26 is a further groove 27, co-operating with a tongue 26, being part of an edge or flange on the permanent backing member 10.

5 The mounting of a partition of this type is performed as follows:—

A panel 2 is for instance by means of a backing board 30, secured to a connecting plate 29 that has the same width as the desired distance between the panels. A cross plate 24 is then mounted by introducing the tongue 26 in groove 25. A panel 1 is thereafter arranged in an interlocking grip, which occurs when tongue 3 of panel 2 is inserted in groove 4 of element 1. A backing member 10 is then fitted by inserting tongue 25 into groove 27 and tongue 9 into grooves 7 and 8. This procedure is repeated until the one side face of the partition with the necessary cross pieces has been erected. All electrical conductors may now be mounted inside the partition wall, as well as possible insulating material. The panels of the opposite face of the partition side is then brought to interlocking grip with the cross pieces 24, step by step as has been described for the first half partition.

Figure 2 shows the joint between the two skins of a double wall of modified design. The individual skins are basically of the same design as that in Figure 1 and the same reference numerals are used. The tongue 9 of the second connection is however, here obtained by turning parts of the flanges of a U-shaped metal member alternatively in opposite directions. Each shank of the member will thus have a partial cross bar at its end, which will fit into the juxtaposed grooves 7 and 8 respectively. The metal member 31 forms part of the wall construction and serves to keep the skins in proper position. An alternative arrangement of the metal member is shown in Figure 3.

Figure 4 shows a further manner of utilizing the edge portion of a metal member for forming the tongue of the second connection. The member 32 in this case has essentially channel form, and one flange thereof is provided with parts alternatively turned 90° in relation to the plane of the flange to form the tongue 9. The other flange 33 is turned twice inwards through 90° to rest against the outer surface of the wall panel 2. Member 32 may be utilized for supporting various kinds of elements connected to the wall—for instance a further wall connected at right

angles thereto—but it may with higher walls just form a strengthening of the structure.

If the building elements 1 and 2 are to be used as partition walls between rooms, said elements are preferably formed with the same height as the height of the room, and one longitudinal side on each element is provided with a groove and the other longitudinal side with a tongue according to the invention. Panels adapted as floor—or roofboards are suitably formed along two bordering sides with grooves, and along the two remaining sides with tongues. The tongues 9, 17, 22, 28 and the co-operating grooves 7, 8, 18, 27 may have the same length as the panels or may be shorter. The material in the edge portions of the panels may be synthetic resin or a suitable metal, for instance aluminium.

#### WHAT WE CLAIM IS:—

1. A building structure composed of panels, joined at their edges by first tongue and groove connection having elements located in the plane of the building structure, as well as by second tongue and groove connection having elements located perpendicular to said plane, characterised in that the two tongue and groove connections are designed to permit a second panel to be swung into the plane of the building structure after being brought into contact with elements of the connections at a first panel already fitted in the plane of the structure, and further in a third member locked in the joint between the two panels and extending outside the same substantially at right angles to the panels.
2. A building structure as claimed in claim 1 in which the third member is a T-shaped edge portion which forms the tongue of the second connection.
3. A building structure as claimed in claim 2 comprising two sets of parallel panels spaced apart from one another, in which the third member is a shallow U-shaped element, the edges of the limbs of which are T-shaped to form the tongues of the second connection in both sets of panels.
4. A building structure composed of panels as claimed in Claim 1 substantially as hereinbefore described with reference to Figures 1—3 of the accompanying drawings.

MARKS & CLERK,  
Chartered Patent Agents,  
Agents for the Applicant(s).



## PATENT SPECIFICATION

424,057



Application Date : July 24, 1934. No. 20749/33.

Complete Specification Accepted : Feb. 14, 1935.

## COMPLETE SPECIFICATION

## Improvements appertaining to the Production of Parquetry Floors

I, JOSEPH SMITH, of 11, Rawsthorne Street, Bolton, in the County of Lancaster (of British nationality), do hereby declare the nature of this invention and in what  
5 manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In the production of floors of the type or class known as parquetry floors,  
10 especially in which pieces of wood are placed and firmly pressed edge and end-wise against each other to form designs of geometrical or other figured effects, it is often found when in use that one or  
15 other of the pieces of wood becomes detached and loose, especially when the pieces of wood are not rigidly nailed or otherwise fixed to each other. It is believed that the most common parquetry  
20 floors are built up solely of rectangular blocks and this is probably due to the cheapness of a floor requiring only one shape of block compared with floors in which more elaborate designs are desired.  
25 The object of the present invention is to provide an improved method of constructing a parquetry floor of the type which shows on its surface wholly rectangular blocks.

The present invention is a method of constructing a parquetry floor whose surface consists of rectangular blocks, which comprises the use of reversible rectangular blocks each of which has protruding flanges forming sphenoidal  
35 grooves on each of its four sides, each groove extending across the whole of the side in which it is situated, the grooves on two co-terminous sides having their  
40 mouths facing upwards when the mouths of the other two grooves on the other two sides face downwards whereby a plurality of such blocks may be built up into a floor covering in which each block is  
45 locked on each side which lies contiguous the side of another such block, and which method also essentially comprises the use of connecting members having flanges adapted to engage beneath the overhang-  
50 ing flanges of two adjacent blocks where a change in direction of laying is required.

In order that my said invention may be readily understood I have hereunto  
55 appended a sheet of drawings illustrative

thereof, to which by figures and letters reference is made in the following description.

Fig. 1 is a longitudinal side elevation of a block which I use in carrying out the method according to my invention. 60

Fig. 2 is a plan of the block shown by Fig. 1.

Fig. 3 is an end elevation seen from right to left of the block shown by Fig. 1 with an adjacent block (in section) to the rear of same. 65

Fig. 4 is a perspective view of the block shown in Fig. 1.

Fig. 5 is a side elevation of the member used in changing the direction of laying. 70

Fig. 6 is a sectional end elevation of the blocks as shown by Fig. 3 and with the additional member in its relative position therewith. 75

The formation of the pieces of wood *a* of the rectangular shape shown by Fig. 2, and of the desired thickness for producing a floor covering, necessitates said thickness being maintained throughout the whole of the floor. 80

Each of the rectangular pieces of wood is cut along its two sides and crosswise its two ends so that flanges *c*<sup>1</sup> and *c*<sup>2</sup> on said sides, and *a*<sup>2</sup>, *b*<sup>2</sup> across its ends, are formed to extend from the upper and lower parts *b* respectively, the former to overhang and the latter to extend beyond same in order that each of these flanges may be placed in position and engagement with the other, as is hereinafter explained. 90

In the formation of the flanges *a*<sup>2</sup> and *b*<sup>2</sup> on each block *a* the cutting tool is arranged to produce a groove *a*<sup>1</sup> and *b*<sup>1</sup> along each flange and across each end. 95

This groove is of an angular shape in cross section which will enable the wedge-shaped edge 2 in each case to fit snugly into and fill the corresponding space 3 on the adjoining block *a* when assembled to cover the floor they are to produce, by which means the wedging actions of the one, when forced into position with the other, produce a binding effect which is very efficient. 100

The formation of the longitudinal flanges *c*<sup>2</sup> and crosswise flanges *b*<sup>2</sup> is carried out so as to have the depth of each flange from its base to its edge (as indicated by the arrows *x* — — *y*, Fig. 7), so 105 110

that it equals the depth from the upper surface  $x^1$  downwardly to the edge  $y^1$  of the same figure, in order that when thus produced the assembling of the blocks in their final adjoining positions to form the floor, the engagement of the wedge shaped portions with the wedge shaped grooves allows the assembled blocks to be level and even by all their upper surfaces occupying one and the same plane, while their base surfaces will also all occupy another plane that is parallel to the one above, with all the flanges and grooves intersecting as described.

In laying the blocks to cover a floor the first block would be placed at the left hand corner of said floor, and each succeeding block would be placed with one of its overhanging flanges  $b^2$  within the groove  $a^1$  or  $c^1$  and in this way the covering of the floor would proceed to the right and to the front, so that each block would present two upturned edges (longitudinal and crosswise) to receive the next blocks, and each block already laid would be prevented from being removed at any time by reason of having its said two edges held down by the succeeding blocks.

The firm gripping of each block to the others is strong enough to resist the strains caused by shrinkage of the wood and so any space left by said shrinking can be made to appear at any desired side of the room where an unnoticeable strip of packing may be placed.

By forming the joints in the manner described the floor of the room may be formed of concrete or any other floor-producing material and the blocks (with the usual plastic building substance, as pitch or the like) laid upon its surface without any other fixing means being necessary.

In order that I may reverse the direction of laying the blocks for the purpose of fitting within a recess in a room or where otherwise necessary I construct a small block 4, as shown by Figs. 6 and 7. This block 4 may then slide beneath the

downturned edge of a block previously laid, and it will then present an upturned edge  $3a$  upon which succeeding blocks may be placed. By these means the upper surface of the blocks and the design which they make is in no way interfered with.

I wish it to be understood that I do not claim *per se* the rectangular block  $a$  as shown in any of the Figures of the accompanying drawings and that an essential feature of my method of constructing a parquetry floor is the use of the member such as 4 for enabling a reverse in the laying direction to be effected.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A method of constructing a parquetry floor whose surface consists of rectangular blocks, which comprises the use of reversible rectangular blocks each of which has protruding flanges forming sphenoidal grooves on each of its four sides, each groove extending across the whole of the side in which it is situated, the grooves on two co-terminous sides having their mouths facing upwards when the mouths of the other two grooves on the other two sides face downwards whereby a plurality of such blocks may be built up into a floor covering in which each block is locked on each side which lies contiguous the side of another such block, and which method also essentially comprises the use of connecting members having flanges adapted to engage beneath the overhanging flanges of two adjacent blocks where a change in direction of laying is required.
2. A method according to Claim 1 where either side of the rectangular blocks may be uppermost.

Dated the 24th day of July, 1934.

SAMUEL HEY,  
Agent.

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Fig. 1

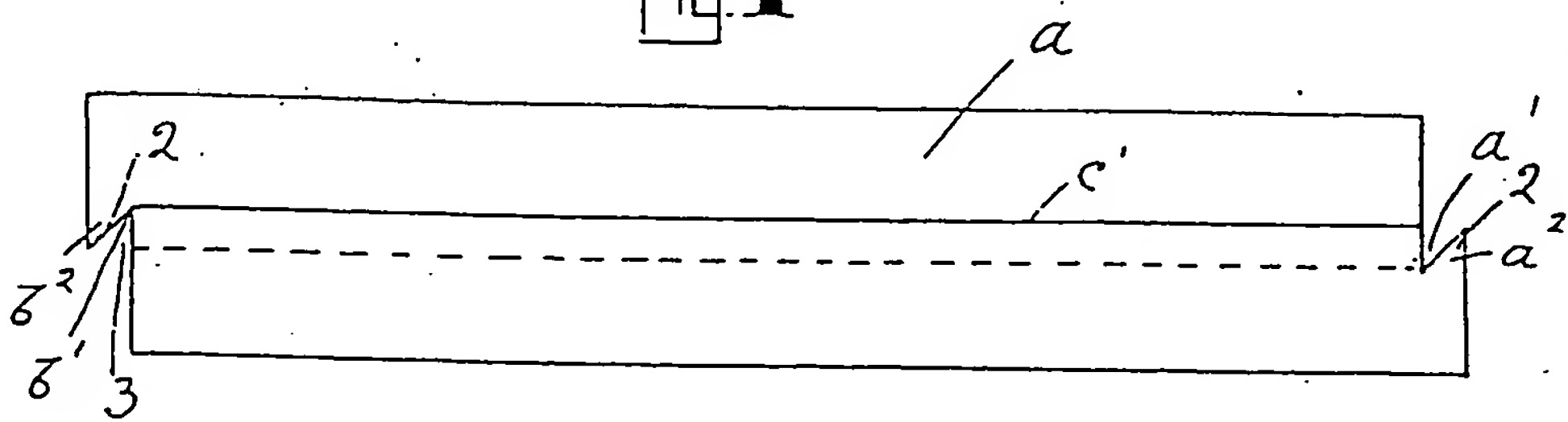


Fig. 2

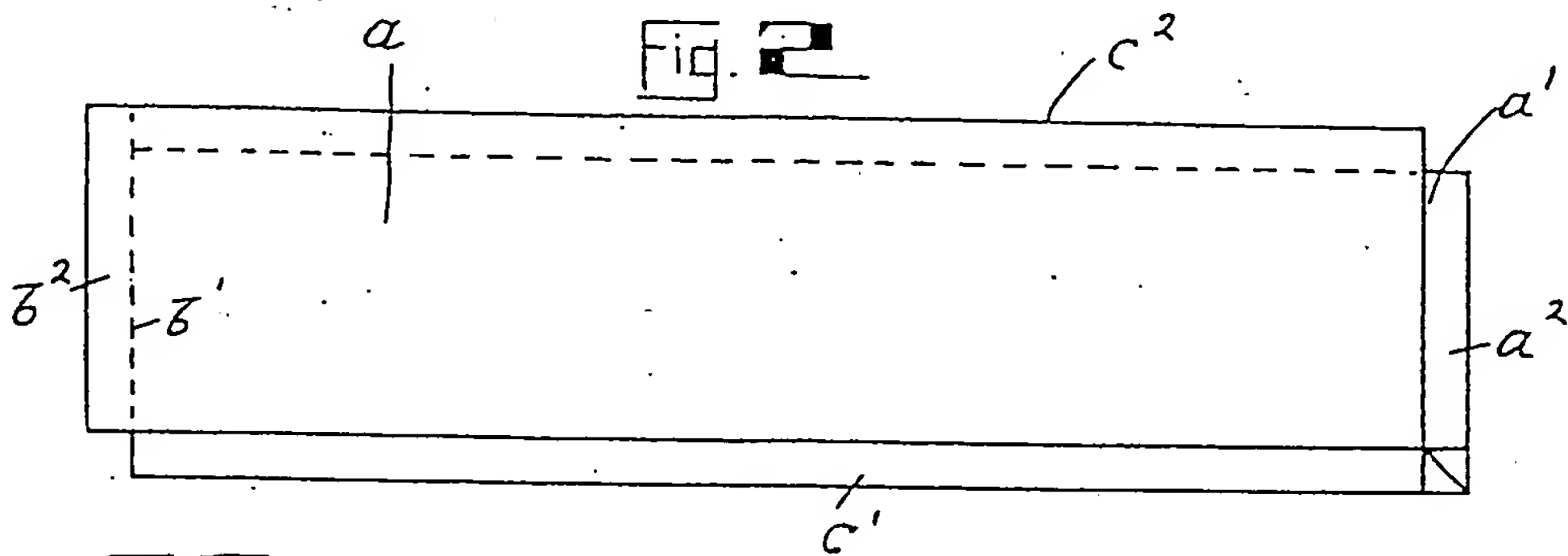


Fig. 3

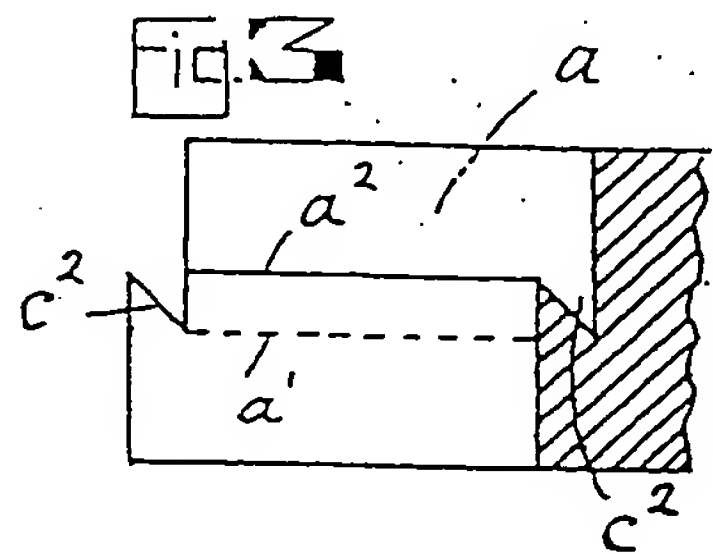


Fig. 4

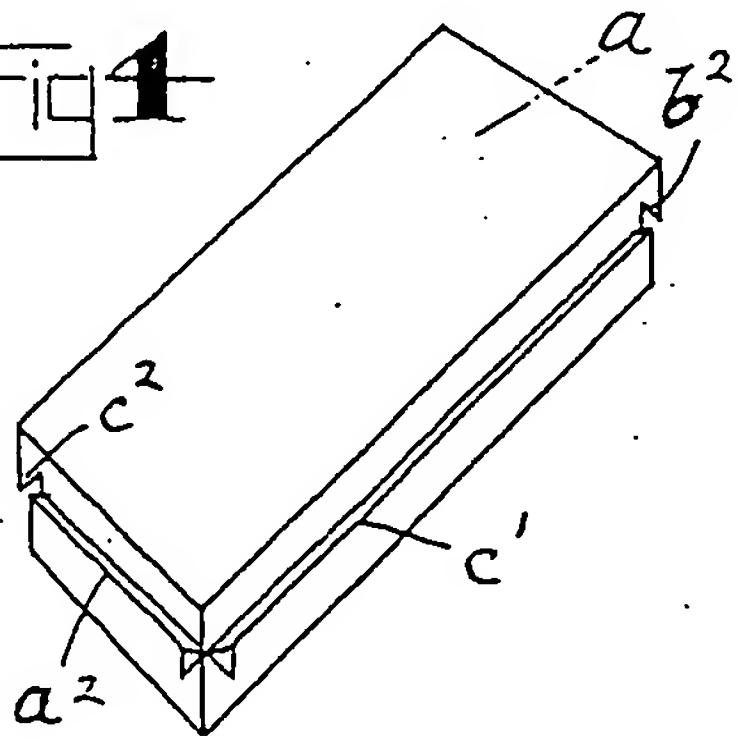


Fig. 5

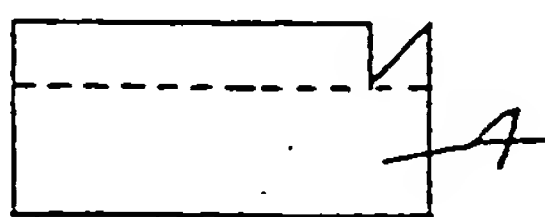


Fig. 6a

